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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,018	07/15/2003	Daniel C. Merkel	H0004175	8618

7590 05/23/2005

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EXAMINER
NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
1754	

DATE MAILED: 05/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,018	MERKEL ET AL.	
	Examiner	Art Unit	
	Ngoc-Yen M. Nguyen	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, 10-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6, 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belter (5,874,658) in view of Swain (5,895,639).

Belter '658 discloses a method of separating a mixture of at least one hydrofluorocarbon and hydrogen fluoride comprising treating said mixture with a compound selected from the group consisting of an alkanolamine and sulfuric acid (note column 1, lines 20-55). Sulfuric acid, i.e. 100% (1.8035 specific gravity) or aqueous solutions of sulfuric acid, i.e. <100% H_2SO_4 (specific gravity from about 1.830 to about 1.0051) or aqueous solutions of sulfuric acid admixed with at least one alkali metal sulfate can be used (note column 1, lines 50-55). The concentration for the sulfuric acid with a specific gravity of 1.0051 is between 1 and 2 %, this value is less than the claimed range of "less than about 93 wt.%".

The hydrofluorocarbon in Belter '658 can be 1,1,1,3,3-pentafluoropropane (hfc-245fa)(note column 3, lines 1-3).

For other values for the concentration of the sulfuric acid, the range disclosed in Belter '658 overlaps the claimed range. With respect to the encompassing and

overlapping ranges previously discussed, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of invention to select the portion of the prior art's range which is within the range of the applicants' claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. *In re Boesch*, 205 USPQ 215. Additionally, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. *In re Malagari*, 182 USPQ.

Beside the hfc-245fa as disclosed in the examples, Belter '658 discloses generically that process can be used to separate HF from "hydrofluorocarbon" (note claim 1). Thus, it would have been obvious to one of ordinary skill in the art to use the process of Belter '658 to separate other hydrofluorocarbon, other than hfc-245a, from HF.

The difference not yet discussed is Belter '658 does not disclose that the mixture is an azeotrope or azeotrope like mixture and the step of separating HF from sulfuric acid.

Swain '639 discloses a process for separation of hydrogen fluoride from fluorocarbon/HF mixture by sulfuric acid (note claim 1). Swain '639 also teaches that the mixture can be an azeotrope (note column 2, lines 37-38). Swain further discloses that HF is separated from the sulfuric acid by distillation (note column 4, lines 13-14). The separated HF and sulfuric acid can be recycled (note column 3, lines 23-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate the HF from the sulfuric acid in the process of Belter '658, as suggested by Swain '639 because by doing so the HF and sulfuric acid can be recycled. Since the HF acid used in Belter '658 is anhydrous hydrogen fluoride (note column 3, lines 2-3), it would also have been obvious to one skilled in the art to optimize the distillation process to obtain anhydrous HF. The Examiner takes Official notice that flash distilling and the step of distilling a diluted HF to obtain anhydrous hydrogen fluoride are known and conventional steps in the art.

Claims 1-8, 10-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belter '658 in view of Swain '639 and Tung et al (5,763,706).

Belter '658 and Swain '639 are applied as stated in the above rejection.

The difference not yet discussed is Belter '658 does not disclose the presence of a chlorine-containing compound in the mixture.

Tung '706 discloses a process for producing 1,1,1,3,3 pentafluoropropane (i.e., HFC 245 fa) by reacting pentachloropropane with hydrogen fluoride in the presence of a fluorination catalyst (note claim 1). Tung '706 discloses that the product stream contains HFC-245 fa, HF, HCl, and organic by-products including 1,3,3,3 tetrafluoropropene, 1-chlorotetrafluoropropene. The HCl was removed from the product stream, and the HCl free product is then fed to a sulfuric acid absorber to extract excess HF and to recycle HF back to the reactor (note column 4, lines 53-61). Thus, Tung '706

fairly teaches that the mixture which is subjected to HF recovering step would contain not only fluorine-containing compound but also chlorine-containing compound.

It would have been obvious to one of ordinary skill in the art to use the process of Belter '658 for recovering HF from a mixture containing both F- and Cl-containing compounds, as suggested by Tung '706 because such mixture is desired to be separated in order to recover and recycle the HF.

Applicant's arguments filed February 9, 2005 have been fully considered but they are not persuasive.

Applicants argue that Belter does not suggest a process for separating hydrogen fluoride from an azeotrope or azeotrope like mixture.

Swain is now applied to teach the desire for separating HF from an azeotrope containing HF and HCF 245 fa.

For the limitation "hydrochlorocarbon", Tung is applied above.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The IDS filed February 2, 2005 was received. However, GB 1052118 was not considered because a copy was not enclosed and could not readily be obtained by the Office.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stan Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.

Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn
May 16, 2005